

CLAIMS:

1. A tilt control device for controlling inclination of a recording surface of an optical disc (1), said tilt control device comprising:

- a) tilt detecting means (3) for detecting said inclination of said recording surface;
- b) focus control means (7) for generating a focus controlling output; and
- 5 c) focus actuating means (11) for controlling a focusing state of an optical recording/reproducing beam based on said focus controlling output, characterized by
- d) calibrating means (10) for calibrating an output offset of said tilt detecting means by using said focus controlling output.

2. A device according to claim 1, characterized in that said calibrating means (10) is arranged to measure a mean focus controlling output and to use said mean focus controlling output for calibration.

3. A device according to claim 1 or 2, characterized in that said focus controlling output is a focus voltage or a controller integrator output.

4. A device according to any one of claims 1 to 4, characterized by a sledge (4) for moving an optical pickup unit, a tilt platform (5) for changing said inclination of said recording surface, a tilt adjusting means (9) for adjusting said tilt platform (5), and a tilt control means (10) for controlling said sledge (4) and said tilt adjusting means (9).

5. A device according to claim 5, characterized in that said tilt control means (10) is arranged to position said sledge (4) at a radius corresponding to the rotation point between a tilt frame defined by said tilt platform (5) and said optical disc

10090917.030502

Sub
AS

(1), to move said sledge (4) outward over a first predetermined distance, to control said tilt adjusting means (9) to adjust said tilt platform (5) until the same output value of said focus control means (7) as obtained at said radius corresponding to said rotation point is obtained, and to move said sledge (4) inward over a second predetermined distance, wherein said
5 calibrating means (10) is arranged to use the output value of said tilt detecting means (3) obtained at said second predetermined distance as said output offset used for said optical disc (1).

6. A device according to claim 6,

10 characterized in that

said second predetermined distance corresponds to the half of said first predetermined distance.

7. An optical disc player comprising a tilt control device as claimed in any one of claims 1 to 7.

8. A tilt control method for controlling inclination of a recording surface of an optical disc (1), said tilt control method comprising the steps of:

- 20 a) generating a focus controlling output, and
b) controlling a focusing state of an optical recording/reproducing beam based on said focus controlling output,
characterized by
c) calibrating an output offset of a tilt detecting means (3) by using said focus controlling output.

25 9. A method according to claim 10,

characterized in that

said calibrating step comprises measuring a mean focus controlling output and using said mean focus controlling output for calibration.

30 10. A method according to claim 10 or 11,

characterized in that

said calibrating step comprises measuring said focus controlling output at a rotation point between a tilt frame defined by a tilt platform (5) and said optical disc (1), adjusting said tilt

2050507.030507

Sub
A3

Sub A3 5
platform (5) until the same focus controlling output is obtained at a first predetermined distance outward from said rotation point, and using a focus controlling output obtained at a second predetermined distance inward from said first predetermined distance as said output offset of said tilt detecting means (3) for said optical disc (1).

11. A method according to any one of claims 10 to 12, characterized in that said second predetermined distance corresponds to the half of said first predetermined distance.

10
12. A tilt control device for controlling inclination of a recording surface of an optical disc (1), said tilt control device comprising:

- 10050537 " 030500
15 a) focus control means (7) for generating a focus controlling output; and
b) focus actuating means (11) for controlling a focusing state of an optical recording/reproducing beam based on said focus controlling output, characterized by
c) tilt control means (10) for adjusting a tilt frame based on measurements of the controlling output of said focus control means (7) at at least two different radial positions at two tilt frame positions.

20
13. A device according to claim 14, characterized in that said focus controlling output is a focus voltage or a controller integrator output.

25
14. A device according to any one of claims 14 to 16, characterized by a sledge (4) for moving an optical pickup unit, a tilt platform (5) for changing said inclination of said recording surface, a tilt adjusting means (9) for adjusting said tilt platform (5), wherein said tilt control means (10) is arranged to control said sledge (4) and said tilt adjusting means (9) so as to perform said measurements.

Sub A4
30
15. A device according to claim 17, characterized in that

said tilt control means (10) is arranged to position said sledge (4) at said at least two different radial positions, to control said tilt adjusting means (9) to adjust said tilt platform (5) to said two predetermined tilt frame positions, to measure said focus controlling output at said at least two different radial positions at said two different radial tilt positions, and to adjust said tilt platform (5) based on the mean radial tilt obtained for said two predetermined tilt frame positions in between said at least two different radial positions.

Sub
A5 >
10 16. An optical disc player comprising a tilt control device as claimed in any one of claims 14 to 18.

17. An optical disc player as claimed in claim 19, wherein said optical disc player is a DVD player.

15 18. A tilt control method for controlling inclination of a recording surface of an optical disc (1), said tilt control method comprising the steps of:
a) generating a focus controlling output, and
b) controlling a focusing state of an optical recording/reproducing beam based on said focus controlling output,
characterized by
20 c) adjusting a tilt frame based on measurements of said controlling output at at least two different radial positions at two predetermined tilt frame positions.

19. A method according to claim 21,
characterized in that

25 said adjusting step comprises measuring a mean focus controlling output and using said mean focus controlling output for adjustment.

20. A method according to claim 21 or 22,
characterized in that

Sub
A6 >
30 said adjusting step comprises measuring said focus controlling output at said at least two different radial positions at said two different radial tilt positions, and adjusting said tilt platform (5) based on the mean radial tilt obtained for said two predetermined tilt frame positions in between said at least two different radial positions.